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Date of Application: March 26, 2003

Application Number: Patent Application No. 2003-085438

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December 10, 2003

Commissioner,

Japan Patent Office Yasuo IMAI

Number of Certification: 2003-3102180

Filing date 2003.03.26

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[Name of the Document] Patent Application

[Identification Number] CALS-718

[Filing Date] March 26, 2003

[Addressee] Commissioner, Patent Office

[International Patent Classification] B41M 3/00

[Title of Invention] ORNAMENT AND INDICATOR PANEL FOR
VEHICLE DASHBOARD

[Number of claim(s)] 6

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[Indication of Fee]

[Prepayment Register Number] 001982

[Amount of Fee] ¥21,000

[List of Filed Material(s)]

[Name of Material] Specification 1

[Name of Material] Drawings 1

[Name of Material] Abstract 1

[Number of General Power-of-Attorney] 0010131

[Request for Proof] Yes

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[NAME OF THE DOCUMENT] SPECIFICATION

[TITLE OF THE INVENTION] ORNAMENT AND INDICATOR PANEL FOR
VEHICLE GAUGES

[CLAIMS FOR A PATENT]

- 5 [CLAIM 1] An ornament comprising a substrate (30), an
ink-acceptance layer (33, 34) formed on at least one surface
of the substrate (30), and a printed layer (35, 36) formed on
the ink-acceptance layer (33, 34), wherein the ornament
contains at least one or more benzotriazole series compounds
10 selected from the following (a) through (i) in the
ink-acceptance layer (33, 34), the ornament characterized in
that a content of the benzotriazole series compounds to a total
of the ink acceptance layer (33, 34) is made to be beyond 7
weight % but not more than 15 weight %.
- 15 (a) phenyl-5-benzotriazole carboxylate
(b) methyl-5-benzotriazole carboxylate
(c) phenyl-1-(4-hydroxy-3-[N-(2-tetradecyloxyphenyl)
carbamoyl]-1-naphthyloxymethyl)-1H-
benzotriazole-5-carboxylate
- 20 (d) phenyl-1-(4-hydroxy-3-[N-(2-tetradecyloxyphenyl)
carbamoyl]-1-naphthyloxymethyl)-1H-
benzotriazole-6-carboxylate
(e) 5-benzotriazole carboxylate
(f) benzotriazole-5-carboxylate
- 25 (g) 1-alkyloylbenzotriazole (a carbon number of alkyloyl group
is from 8 to 24)
(h) 1-alkenoylbenzotriazole (a carbon number of alkenoyl group
is from 8 to 24)
(i) benzotriazole series compounds having a constitutional unit

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of polyalkylene glycol

[CLAIM 2] The ornament recited in claim 1, characterized in that the content of the benzotriazole series compounds is made from 9 weight % to 13 weight %.

5 [CLAIM 3] The ornament recited in claim 1 or 2, characterized in that the printed layer (35, 36) is formed by an ink-jet printing method in which droplets of ink are injected on the ink acceptance layer (33, 34).

[CLAIM 4] An indicator panel for vehicle gauges, comprising
10 an indicator substrate (30) having transparency, an ink-acceptance layer (33, 34) formed on at least one surface of the indicator substrate (30) having transparency, and a printed layer (35, 36) formed on the ink-acceptance layer (33, 34), wherein the indicator panel for the vehicle gauges contains
15 at least one or more benzotriazole series compounds selected from the following (a) through (i) in the ink-acceptance layer (33, 34), the indicator panel for the vehicle gauges characterized in that a content of the benzotriazole series compounds to a total of the ink acceptance layer (33) is made
20 to be beyond 7 weight % but not more than 15 weight %.

(a) phenyl-5-benzotriazole carboxylate

(b) methyl-5-benzotriazole carboxylate

(c) phenyl-1-(4-hydroxy-3-[N-(2-tetradecyloxyphenyl) carbamoyl]-1-naphthyloxymethyl)-1H-

25 benzotriazole-5-carboxylate

(d) phenyl-1-(4-hydroxy-3-[N-(2-tetradecyloxyphenyl) carbamoyl]-1-naphthyloxymethyl)-1H-

benzotriazole-6-carboxylate

(e) 5-benzotriazole carboxylate

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(f) benzotriazole-5-carboxylate

(g) 1-alkyloylbenzotriazole (a carbon number of alkyloyl group is from 8 to 24)

5 (h) 1-alkenoylbenzotriazole (a carbon number of alkenoyl group is from 8 to 24)

(i) benzotriazole series compounds having a constitutional unit of polyalkylene glycol

[CLAIM 5] The indicator panel for the vehicle gauges recited in claim 4, characterized in that the content of the benzotriazole series compounds is made from 9 weight % to 13 weight %.

[CLAIM 6] The indicator panel for the vehicle gauges recited in claim 4 or 5, characterized in that the printed layer (35, 36) is formed by an ink-jet printing method in which droplets of ink are injected on the ink acceptance layer (33, 34).

[DETAILED DESCRIPTION OF THE INVENTION]

[0001]

[Field of the Invention]

The present invention relates to an ornament such as a interior member applied to a vehicle for example, and an indicator panel for vehicle gauges of a transmissive illumination type.

[0002]

[PRIOR ART]

25 Ink-jet printing has been conventionally widely used as one of the most popular printing methods, together with an electrophotography printing (PPC). Ink-acceptance layers, on which the ink-jet printing is carried out, are required to have good absorbency for water-soluble inks and water-resistance.

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[0003]

Here, an instrument panel disposed in a front part of an occupant compartment of a vehicle is provided with an indicator panel for vehicle gauges. On the indicator panel for the vehicle gauges, a speedometer, engine tachometer and the like are disposed. These speedometer and such form an ink-acceptance layer on a base substrate for an indicator panel and further form a printed layer on the ink-acceptance layer by using the ink jet printing or such. (for example, see Patent Document 1)

[0004]

[Patent Document 1]

Patent Application Laid-open No. 2002-98558

[0005]

15 [PROBLEMS TO BE SOLVED BY THE INVENTION]

However, in prior indicator panels for vehicle gauges, light resistance of the ink-acceptance layer is not necessarily high, and thereby there is a problem that it is easily faded by radiation of ultraviolet rays contained in solar rays. On the other hand, it contains a contradiction that an intention to improve the light resistance leads to reduction in clearness of the printed matters.

[0006]

Then, the present invention is intended for providing an ornament and an indicator panel for vehicle gauges being good in light resistance and having clearness in printing.

[0007]

[MEANS FOR SOLVING THE PROBLEMS]

An invention recited in the claim 1 is an ornament provided

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with a substrate, an ink-acceptance layer formed on at least one surface of the substrate, and a printed layer formed on the ink-acceptance layer, wherein the ornament contains at least one or more benzotriazole series compounds selected from the following (a) through (i) in the ink-acceptance layer,

the ornament characterized in that a content of the benzotriazole series compounds to a total of the ink acceptance layer is made to be beyond 7 weight % but not more than 15 weight %.

10 [0008]

(a) phenyl-5-benzotriazole carboxylate

(b) methyl-5-benzotriazole carboxylate

(c) phenyl-1-(4-hydroxy-3-[N-(2-tetradecyloxyphenyl) carbamoyl]-1-naphthyloxymethyl)-1H-

15 benzotriazole-5-carboxylate

(d) phenyl-1-(4-hydroxy-3-[N-(2-tetradecyloxyphenyl) carbamoyl]-1-naphthyloxymethyl)-1H-

benzotriazole-6-carboxylate

(e) 5-benzotriazole carboxylate

20 (f) benzotriazole-5-carboxylate

(g) 1-alkyloylbenzotriazole (a carbon number of alkyloyl group is from 8 to 24)

(h) 1-alkenoylbenzotriazole (a carbon number of alkenoyl group is from 8 to 24)

25 (i) benzotriazole series compounds having a constitutional unit of polyalkylene glycol

[0009]

An invention recited in the claim 2 is the ornament recited in claim 1, characterized in that the content of the

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benzotriazole series compounds is made from 9 weight % to 13 weight %.

[0010]

5 An invention recited in claim 3 is the ornament recited in claim 1 or 2, characterized in that the printed layer is formed by an ink-jet printing method in which droplets of ink are injected on the ink acceptance layer.

[0011]

10 An invention recited in claim 4 is an indicator panel for vehicle gauges provided with an indicator substrate having transparency, an ink-acceptance layer formed on at least one surface of the indicator substrate having transparency, and a printed layer formed on the ink-acceptance layer, wherein the indicator panel for the vehicle gauges contains at least one
15 or more benzotriazole series compounds selected from the following (a) through (i) in the ink-acceptance layer, the indicator panel for the vehicle gauges characterized in that a content of the benzotriazole series compounds to a total of the ink acceptance layer is made to be beyond 7 weight % but
20 not more than 15 weight %.

[0012]

(a) phenyl-5-benzotriazole carboxylate

(b) methyl-5-benzotriazole carboxylate

(c) phenyl-1-(4-hydroxy-3-[N-(2-tetradecyloxyphenyl)
25 carbamoyl]-1-naphthyloxymethyl)-1H-benzotriazole-5-carboxylate

(d) phenyl-1-(4-hydroxy-3-[N-(2-tetradecyloxyphenyl)
carbamoyl]-1-naphthyloxymethyl)-1H-benzotriazole-6-carboxylate

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(e) 5-benzotriazole carboxylate

(f) benzotriazole-5-carboxylate

(g) 1-alkyloylbenzotriazole (a carbon number of alkyloyl group is from 8 to 24)

5 (h) 1-alkenoylbenzotriazole (a carbon number of alkenoyl group is from 8 to 24)

(i) benzotriazole series compounds having a constitutional unit of polyalkylene glycol

[0013]

10 An invention recited in claim 6 is the indicator panel for the vehicle gauges recited in claim 4 or 5, characterized in that the printed layer is formed by an ink-jet printing method in which droplets of ink are injected on the ink acceptance layer.

15 [0014]

[EFFECT OF THE INVENTION]

20 In accordance with the invention recited in the claim 1, because a content of the benzotriazole series compounds to a total of the ink acceptance layer is made to be beyond 7 weight % but not more than 15 weight %, light resistance is greatly improved and an ornament having clear print can be obtained.
[0015]

25 In accordance with the invention recited in the claim 2, because the content of the benzotriazole series compounds is made from 9 weight % to 13 weight %, the effect by the claim 1 can be further elevated. In concrete, a degree of clearness of printing in particular is further improved.
[0016]

 In accordance with the invention recited in the claim 3,

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because the printed layer is formed by the ink-jet printing method, a printing block or such used in the screen printing method come to be unnecessary, thereby it reduces steps of work in printing and printing can be carried out with a reduced cost.

5 [0017]

In accordance with the invention recited in the claim 4, because the ink acceptance layer in the indicator panel for the vehicle gauges is made to be beyond 7 weight % but not more than 15 weight %, the indicator panel for the vehicle gauges having high light resistance and improved clearness in printing can be obtained. Further, in accordance with the ink-acceptance layer, an indicator panel for vehicle gauges can be produced by using the ink-jet process method conventionally unsuitable for such an indicator panel for vehicle gauges.

15 [0018]

In accordance with the invention recited in the claim 5, because the content of the benzotriazole series compounds is made from 9 weight % to 13 weight %, the effect of the claim 4 is further elevated.

20 [0019]

In accordance with the invention recited in the claim 6, because printed layer is formed by an ink-jet printing method, a printing block or such used in the screen printing method come to be unnecessary, thereby it reduces steps of work in printing and printing on the indicator panel for the vehicle gauges can be carried out with a reduced cost.

[0020]

[EMBODIMENTS FOR CARRYING OUT THE INVENTION]

An embodiment of the present invention will be described

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hereinafter on the basis of the drawings.

[0021]

Fig. 1 is a front view of an indicator panel 10 for vehicle gauges in accordance with the embodiment of the present invention. On the indicator panel 10 for the vehicle gauges, a fuel meter 11 is indicated on the left end side, and a first warning portion 12 is indicated at the lower part of the fuel meter 11. Further, at the center side, a speedometer 13 and an engine tachometer 14 are indicated, and, at the right end side, a water thermometer 15 and a second warning portion 16 are indicated. Meanwhile, at the upper part of a space between the speedometer 13 and the engine tachometer 14, a third warning portion 17 is indicated.

[0022]

Further, on the indicator panel 10 for the vehicle gauges, for example white letters, numerals, scales and characters are printed. For example, in the speedometer 13, letters 18 such as "km/h", numerals 19 such as "180" indicating speeds and scales 20 are indicated. Further, for example, in the third warning portion 17, symbols 21 of arrows of hazard lamps are indicated. Meanwhile, so-called background portion which is free from these letter 18 and these scales 20 is formed of a black shading portion 22.

[0023]

Here, the indicator panel 10 can be generally classified into three. More specifically, it is constituted of a transparent portion such as letters 18 in the speedometer 13, and scales 20, which shows desired indication colors when a backlight is not turned on but shows desired transmitted light

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colors when the backlight is turned on, a half-transparent portion of the first through third warning indicators 12, 16 and 17, which are equivalent in color (similar colors) with the background portion of the indicator panel so that the occupants are hard to recognize it day and night when the backlight is not turned on but shows transmitted light colors when a backlight is turned on so that the occupants can recognize the letters and the symbols when the backlight is turned on, and the shading portion 22 of the background portion which is free from any indication such as the letters 18.

[0024]

Fig. 2 is a magnified cross sectional view of the indicator panel 10 for the vehicle gauges. In this drawing, the upper side is disposed at a front face side and the lower side is disposed at a rear face side. Further, the left side portion of the present drawing shows a cross sectional structure in the transparent portion such as the letters 18 and the scales 20, and the right side portion shows a cross sectional structure of the background portion free from the letters 18 and such.

[0025]

A cross section in the transparent portion is composed of a base substrate 30 for the indicator panel, anchor layers 31, 32 formed at the front face side and the rear face side of the base substrate 30 for the indicator panel, and ink-acceptance layers 33, 34 formed at the further front face side and the further rear face side of the anchor layers 31, 32. On the other hand, the cross sectional structure at the shading portion 22 is essentially identical to the cross sectional structure of the transparent portion, but, on the

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ink-acceptance layers 33, 34, printed layers 35, 36 are formed.

[0026]

The base substrate 30 for the indicator panel is composed of a substantially transparent synthetic resin, such as for example polycarbonate (PC), polycarbonate ABS, and ABS. Further, to the anchor layers 31, 32 and the ink-acceptance layers 33, 34, various processes such as coating by a coater and a screen printing may be applied, and number of times of coating or printing may be also not limited. The anchor layers 31, 32 are formed to be about 2 μm in thickness, and the ink-acceptance layers 33, 34 are formed to be respectively 20 μm in thickness.

[0027]

An ink-acceptive resin is included in the ink-acceptance layers 33, 34, and generally a resin for an ink acceptance layer of an ink-jet recording material is used, and in particular a water-soluble or hydrophilic resin having good absorbency for water-soluble inks and water-resistance is preferably used. As such the ink-acceptive resin, synthetic resins such as polyvinyl alcohol, water-soluble cellulose and such, or natural resins such as gelatin, casein and such can be exemplified, but, in particular, water base polyurethane resin having a constitutional unit of a polycarbonate chain is preferably used because light resistance is good. Meanwhile, the water base polyurethane resin having a constitutional unit of a polycarbonate chain is preferably contained to a content beyond 25 weight %, more preferably beyond 50 weight % to the weight of a total of the ink-acceptance layers 33, 34. Further, the water base polyurethane resin having a constitutional unit of

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a polycarbonate chain can be obtained by any publicly known production methods such as making polyol including a polycarbonate chain react with diisocyanate and emulsifying thereafter.

5 [0028]

Furthermore, the ink-acceptance layers 33 and 34 include from 7 weight % to 15 weight % of benzotriazole series compounds to weight of a total of the ink acceptance layer 33, 34, among which a preferable content range is from 9 weight % to 13 weight %.

10 [0029]

As the benzotriazole series compounds, phenyl-5-benzotriazole carboxylate, methyl-5-benzotriazole carboxylate,

15 phenyl-1-{4-hydroxy-3-[N-(2-tetradecyloxyphenyl) carbamoyl]-1-naphthyloxymethyl}-1H-benzotriazole-5-carboxylate, phenyl-1-{4-hydroxy-3-[N-(2-tetradecyloxyphenyl) carbamoyl]-1-naphthyloxymethyl}-1H-benzotriazole-6-carboxylate, 5-benzotriazole carboxylate, benzotriazole-5-carboxylate, 1-alkyloylbenzotriazole where a carbon number of alkyloyl group is from 8 to 24, 1-alkenoylbenzotriazole where a carbon number of alkenoyl group is from 8 to 24, and benzotriazole series compounds having a constitutional unit of polyalkylene glycol can be exemplified, and at least one or more compounds thereof are contained.

25 [0030]

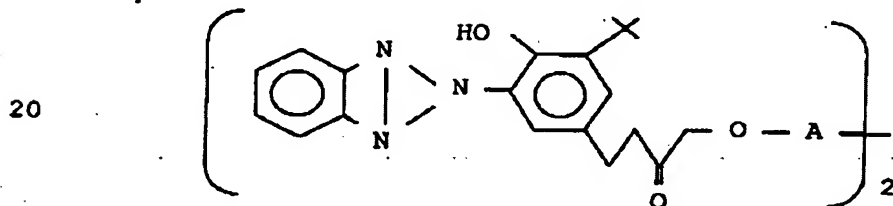
As benzotriazole series compounds, any compounds of the (a)-(i) can be applied without particular limitation, however,

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in particular (i) the benzotriazole series compounds having a constitutional unit of polyalkylene glycol are preferable. As being further specified, as the polyalkylene glycol, polyethylene glycol, polypropylene glycol and such are exemplified. Among them, polyethylene glycol is preferably applied. Moreover, a molecular weight of the polyalkylene glycol requires no limitation, however, is preferably about 300 on an arithmetical average. Meanwhile, as the benzotriazole series compounds having a constitutional unit of polyalkylene glycol, a compound represented by the following formula. (CHEM 1) can be exemplified. In this formula, "A" represents a polyalkylene glycol. In chemistry name, "a condensation compound of methyl-3-[3-t-butyl-5-(2H-benzotriazole-2-yl)-4-hydroxyphenyl] propionate and poly alkylene glycol".

[0031]

[CHEM 1]



By containing such particular benzotriazole series compounds, preventing bronzing of the printed layers 35, 36 without reducing light resistance thereof is enabled. As the reason thereof, these matters are cationic and have absorptivity for ultraviolet rays.

[0032]

Further, ink-acceptance layers 33 and 34 may include

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inorganic pigments such as clay, talc, diatomaceous earth, calcium carbonate, calcium sulfate, barium sulfate, aluminum silicate, titanium oxide, zinc oxide, silicon dioxide, synthetic zeolite, alumina, smectite and such, as well as the
5 aforementioned water-soluble or hydrophilic resin and the benzotriazole series compounds. By addition of such inorganic pigments, absorbency of the ink-acceptance layers 33 and 34 for ink can be improved and blocking can be also prevented. An amount of addition of these inorganic pigments is made from 5
10 to 200-weight part of the inorganic pigments to 100 weight part of the resin. Further, an antifoaming agent, a leveling agent, a light stabilizing agent, a pigment may be added thereto as the need arises.

[0033]

15 Further, the printed layers 35 and 36 can be formed by means of an ink-jet printing method for example. According to the ink-jet printing method, by spraying droplets of black-ink BK for example on the surface of the ink-acceptance layers 33 and 34 and permeating them therein, the printed layers 35 and
20 36 can be formed. The shading portion 22 with the printed layers 35 and 36 has enough absorbency for the black-ink BK by means of the ink-acceptance layers 33 and 34 so that the black-ink is prevented from blotting and clearness thereof is ensured. Thereby boundaries between the transparent portion and the
25 shading portion 22 are clearly formed so that clearness of the letters 18 and the scales 20 is ensured. Meanwhile, the ink is not limited to the black-ink BK and various colored inks such as yellow and blue can be applied.

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[0034]

Because in the shading portion 22 an area rate of a part of the black-ink BK permeating therein is black 100 %, light radiated from a backlight out of the drawing disposed at a lower side of the indicator panel 10 for the vehicle gauges can be nearly perfectly shielded. Further, in the transparent portion printed layers by the black ink BK are not formed at all on the surface of the ink-acceptance layers 33, 34, and, in a sense, it is formed to be black 0 %.

[0035]

Next, a production method of the indicator panel 10 for the vehicle gauges in accordance with the present embodiment will be briefly described.

[0036]

First, as shown in Fig. 2, the anchor layers 31 and 32 are respectively coated on both front and rear surfaces of the base substrate 30 at a thickness of 2 μ m with a coater for example. Next, the ink-acceptance layers 33 and 34 are respectively coated on the anchor layers 31 and 32 at a thickness of 20 μ m with a coater and such. The printed layers 35 and 36 are coated on the ink-acceptance layers 33 and 34 at the shading portion 22 with the ink-jet printing method. More specifically, at the shading portion 22, by sparing the black-ink BK on both surfaces thereof so as to be black 100 %, the printed layers 35, 36 are formed. Further, at the transparent portion, without spraying the black-ink BK, the color of the ink-acceptance layers 33, 34 are made in view. After forming the printed layers 35, 36, moisture contained in the ink-acceptance layers 33, 34 and

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printed layers 35, 36 is thermally dried. Meanwhile, finally, an overcoat including UV absorbing agent may be further coated thereon.

[0037]

5 In accordance with the present embodiment, an indicator panel for vehicle gauges which is unsusceptible to fading in color at a time of being radiated with ultraviolet rays can be obtained. Further, as a result of carrying out ink-jet printing with water-soluble pigment ink, an indicator panel
10 substantially free from bronzing was obtained. As such, it can improve light resistance of, not only the ink-acceptance layers of itself, but also the indicator panel formed of printed layers on the ink-acceptance layers.

[0038]

15 [WORKING EXAMPLE]

Next, the present invention will be described with reference to the working example.

[0039]

First, as shown in Fig. 2, anchor layers 31 and 32 were
20 respectively coated on both front and rear surfaces of base substrate 30 made of polycarbonate at a thickness of 2 μ m with utilizing a coater. Next, ink-acceptance layers 33 and 34 were respectively coated on the anchor layers 31 and 32 at a thickness of 20 μ m with utilizing a coater. The ink-acceptance layers
25 33 and 34 included benzotriazole series compounds having a constitutional unit of polyalkylene glycol at predetermined concentration (In a case of Table 1, described in the table. In a case of Figs. 3 through 5, 4.4 weight % and 9.5 weight %.) relative to weights of the ink-acceptance layers 33 and 34.

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[0040]

Next, printed layers 35 and 36 were respectively coated on the ink-acceptance layers 33 and 34 at a shading portion 22 with utilizing an ink-jet printing method in yellow and black watercolor pigment inks. After printing, moisture contained therein was thermally dried. Results of clearness evaluation of prints are shown in Table 1.

[0041]

The aforementioned indicator panels are submitted to an UV exposure test and the results are shown in Table 1 and graphs of Figs. 3 through 5. Meanwhile, the result of Table 1 is what is measured by chroma meter of CR300 produced by MINOLTA Co., Ltd after a UV exposure test (without dew cycles and at a black-panel temperature of 83 degree C) achieved by SUN SHINE SUPER LONGLIFE WEATHER METER produced by SUGA TEST INSTRUMENTS Co., Ltd.

[0042]

[Table 1]

content of the compound (weight %)	0	5	7	9	11	13	15	17	22
light resistance	bad	bad	bad	good	good	good	good	good	good
clearness of prints	good	good	good	good	good	good	mid.	bad	bad

Fig. 3 is a graph of a result after the UV exposure test with respect to what is formed of the ink-jet acceptance layers 33, 34 and studying color-difference time change thereof. Further, Fig. 4 and Fig. 5 is graphs of a result after the UV exposure test with respect to what is formed of the printed layers 35, 36 by using the water-soluble ink and studying color-difference time change, where Fig. 4 uses the

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ink-acceptance layer with a content of 4.4 weight % of benzotriazole series compounds and Fig. 5 uses the ink-acceptance layer with a content of 9.5 weight % of benzotriazole series compounds.

5 [0043]

As shown in Fig. 3, one having a content of 9.5 weight % of benzotriazole series compounds in the ink-acceptance layers 33, 34 (the example of the present invention) has far smaller color-difference time change as compared with another having a content of 4.4 weight % (comparative example) and hence it is proved that the light resistance was improved. In concrete, one having a content of 9.5 weight % of benzotriazole series compounds was improved in light resistance by 87 % than another having a content of 4.4 weight %. Further, as shown in Figs. 4, 5, with respect to the indicator panel formed of the printed layers 35, 36, it is proved that one having a content of 9.5 weight % of benzotriazole series compounds (the example of the present invention) is improved in light resistance.

[BRIEF DESCRIPTION OF DRAWINGS]

20 [FIG. 1]

A front view of an indicator panel for vehicle gauges shown from the front face side, according to the present embodiment.

[FIG. 2]

A cross sectional view of the indicator panel for vehicle gauges according to the present invention.

[FIG. 3]

A graph showing a result of light resistance tests according to the working example.

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[FIG. 4]

A graph showing a result of light resistance tests according to the working example.

[FIG. 5]

5 A graph showing a result of light resistance tests according to the working example.

[DESCRIPTION OF THE REFERENCE NUMERALS]

10 an indicator panel for vehicle gauges

30 a base substrate for the indicator panel

10 33,34 ink-acceptance layers

35,36 printed layers

[NAME OF THE DOCUMENT] ABSTRACT

[ABSTRACT]

[OBJECT] It is intended for providing an ornament and an
15 indicator panel for vehicle gauges being good in light resistance and having clearness in printing.

[SOLVING MEANS] It is provided with a substrate 30, an ink-acceptance layer 33 contains benzotriazole series compounds formed on at least one surface of the substrate 30,
20 and a printed layer 35 formed on the ink-acceptance layer 33, and a content of the benzotriazole series compounds to a total of the ink acceptance layer 33 is made to be beyond 7 weight % but not more than 15 weight %. The content of the benzotriazole series compounds is preferably made to be beyond 9 weight % but
25 not more than 13 weight %.

[SELECTED FIGURE] FIG. 2

Ref. No.

整理番号=CALS-718

App. No.

特願2003-085438

Filing Date 2003.3.26

提出日 平成15年 3月26日

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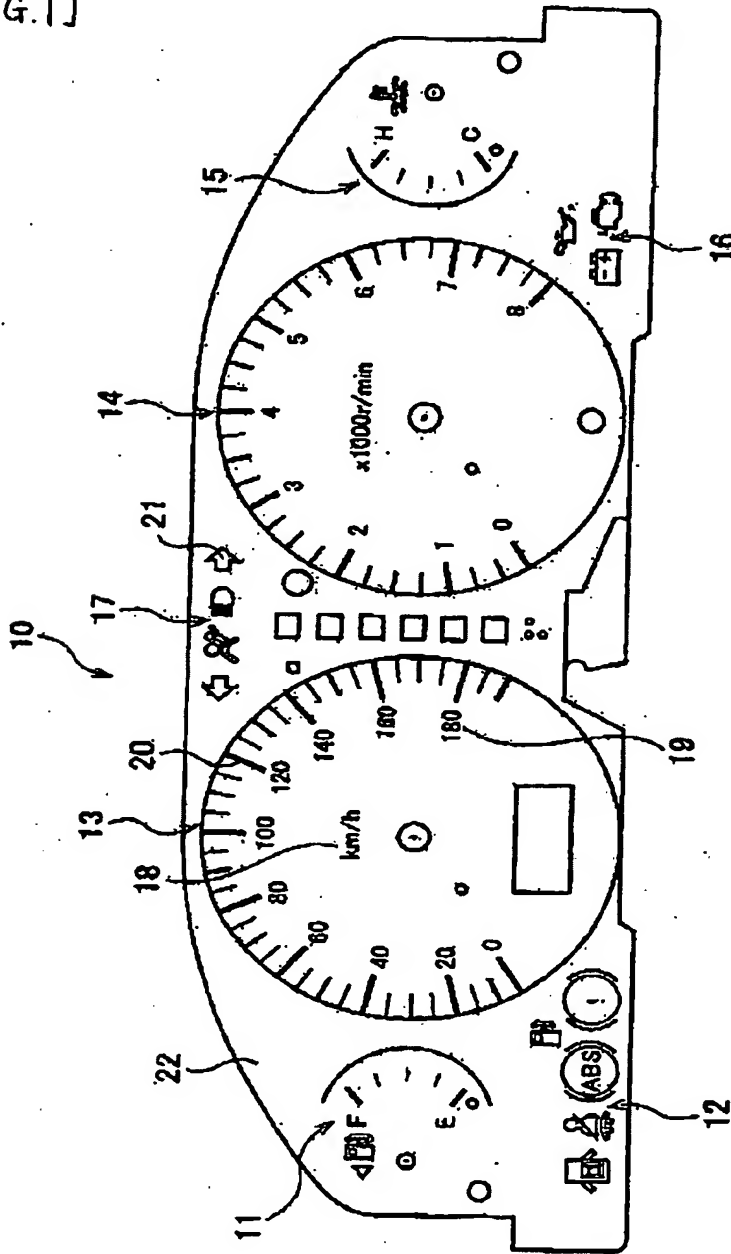
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図面

【DOCUMENT NAME】 DRAWINGS

【図1】

【FIG.1】

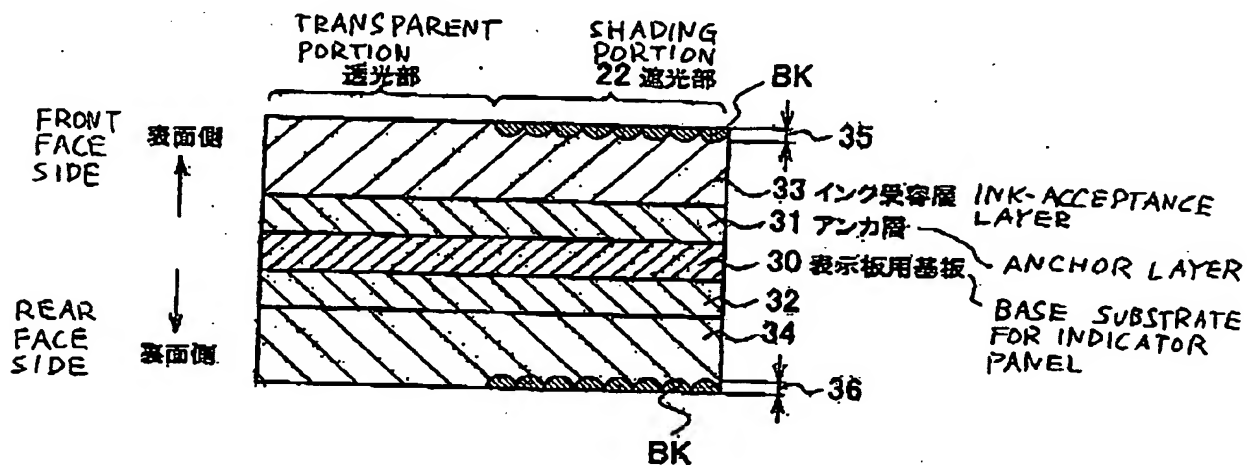


整理番号= C A L S - 7 1 8

提出日 平成15年 3月26日
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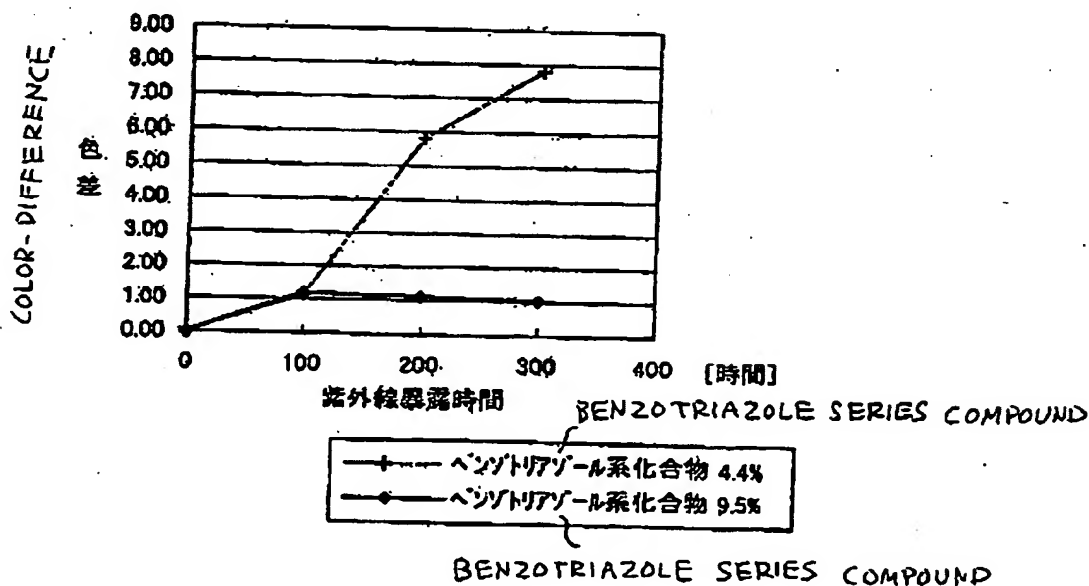
【図2】

【FIG.2】



【図3】

【FIG.3】

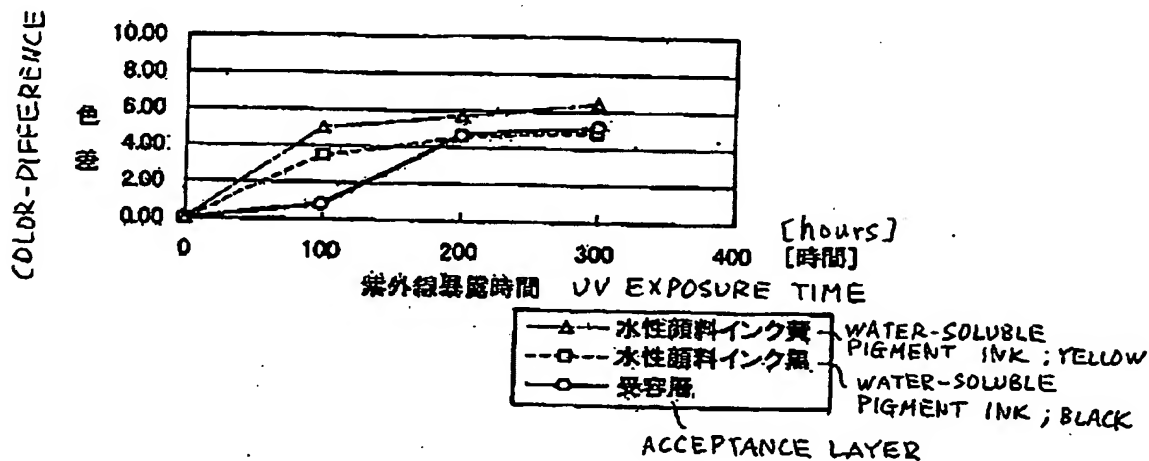


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【図4】
[FIG. 4]【図5】
[FIG. 5]